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NUMBER THEORY AND DIOPHANTINE ANALYSIS.

153. **Proposed by LLOYD HOLSINGER, A. B., 227 Fredonia Avenue, Peoria, Ill.**

If we represent by (k, l) the greatest common divisor of k and l, and by $\phi(k)$ the number of integers prime to k and not greater than k, we have

$$\begin{vmatrix} (1,1) & (1,2) & (1,3) & \ldots & (1,n) \\ (2,1) & (2,2) & (2,3) & \ldots & (2,n) \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ (n,1) & (n,2) & (n,3) & \ldots & (n,n) \end{vmatrix} = \phi(1).\phi(2).\phi(3)\ldots.\phi(n).$$

AVERAGE AND PROBABILITY.

198. **Proposed by J. EDWARD SANDERS, Reinersville, Ohio.**

Find the average length of a hole at random through a given cylinder.

MISCELLANEOUS.

178. **Proposed by V. M. SPUNAR, Mechanical and Civil Engineer, East Pittsburg, Pa.**

Find the sum of the series, $\dfrac{\sin x}{m^2+1} - \dfrac{2\sin 2x}{m^2+4} + \dfrac{3\sin 3x}{m^2+9} - \ldots.$ to infinity.

ERRATA.

Page 100, line 2 from bottom, for "(t_m, s_m)" read $\rho(t_m, s_m)$.

Page 101, line 1 from top, for "positive" read negative; for "negative" read positive.

Page 101, line 12 from top, for "$(t, \rho(t, P(t, r)))$" read $\rho(t, P(t, r))$.

Page 101, line 13 from bottom, for "I" read δ in each case.

Page 102, line 4 from top, for "modulo 1" read modulo l.

Page 102, line 14 from top, for "$\rho(t, s) > r_2$" read $\rho(t, s) \geqq r_2$.

Page 102, lines 8, 9, and 11 from bottom, the number (3) should go with the equation of line 11, and (4) should go with the equations of lines 8 and 9, which should be braced.

Page 102, line 8 from bottom, for "$y(t+h) - \lambda x'(t+h)$" read $y(t+h) + \lambda x'(t+h)$.

Page 103, line 10 from bottom, for "$x(t+\bar{h}) - y'(t+\bar{h})$" read $x(t+\bar{h}) - \bar{\lambda} y'(t+\bar{h})$.

Page 103, line 3 from bottom, for "π" read ρ.

NOTE.

The radicals on pp. 76-77 are connected by the relation

$$8\sqrt{C_\pm} = \sqrt{D_+}.(a-\sqrt{B}) \pm \sqrt{D_-}.(a+\sqrt{B}).$$

This relation invalidates a criticism of the accuracy of the results found.

L. E. D.